Source Water Assessment Program (SWAP) Report for Mary Lyon Nursing Home

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge **areas** of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program

Date Prepared
October 8, 2003

Table 1: Public Water System (PWS) Information

PWS Name	**Mary Lyon Nursing Home**
PWS Address	**34 Main Street**
City/Town	**Hampden, Massachusetts**
PWS ID Number	**1120001**
Local Contact	**Mr. Nelson Richmond**
Phone Number	**413-566-5511**

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Well #1	1120001-01G	256	645	High
Well #2	1120001-02G	236	580	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:
1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

Description of the Water System

Mary Lyon Nursing Home is located on Main Street in Hampden. The activities and land uses consist of all facilities associated with a 100-bed nursing home including parking, kitchen, laundry, boiler, maintenance, and hairdressing facilities. The nursing home is also located immediately adjacent to the Scantic River. Hampden does not have municipal water or wastewater systems and therefore the facility is served by two, on-site water supply wells and a septic system for wastewater disposal. Natural gas is utilized for the boilers but there are 2, 275-gallon, AST, diesel fuel tanks for the back-up generator.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by **the** water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Both wells were installed in 1969 and are 6-inch diameter, bedrock wells. Well #1 is located in the courtyard, is approximately 180 feet deep and based on metered data is capable of producing 11,000 gpd. Well #2 is located on the south side of the facility immediately adjacent to the laundry, the generator and an electrical transformer. Well #2, was originally drilled to a depth of 245 feet but in 1986 was over drilled to a total current depth of 420 feet. In 1991, the Department approved a withdrawal rate of 5.6 gpm based on pumping test data. Geologic mapping in the area indicates overburden deposits of up to approximately 30 feet of sand with approximately 50 feet depth of till over bedrock. The facility is located immediately east of the approximate location of the eastern border fault between the sedimentary rocks of the Connecticut River valley and the volcanic and metamorphic rocks of the uplands to the east. The bedrock valley was filled with stratified drift (sand and gravel) during the recession of the glaciers some 12,000 to 18,000 years ago and the nursing home is located at the edge of the valley. Bedrock at the site is mapped as schist of the Erving Formation.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water are allowed to occur or activitiesthat are non-threatening. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller then the IWPA. The Zone I protective radii for the Wells #1 and #2 are 256 feet and 236 feet, respectively. The IWPA radii are 645 feet and 589 feet, respectively. These protective radii were calculated based on metered water us from Well #1 and an approved withdrawal rate for Well #2. Please refer to the attached map that shows the Zone I and IWPA.

The Zone I area for the well is not conforming to current DEP requirements. The Zone Is include all or part of the nursing home facility including the parking areas and the septic system, an adjacent residence and Main Street. Additional commercial facilities

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Transportation corridors/parking	Yes	Yes	Moderate	Petroleum products, hazardous materials spilled during accidents and stormwater runoff
Landscaping	Yes	Yes	Moderate	Do not use pesticide/fertilizers
Office facilities and parking	Yes	Yes	Moderate	Limit road salt usage. Uuse BMPs for household hazardous materials. Monitor parking areas
ASTs (diesel for generator)	Yes	Yes	High	Petroleum products – accidental release. Ranking increased to high due to proximity to Well #2 and condition of the tanks.
Nursing home	Yes	Yes	Low	Septic systems and household hazardous materials
Inappropriate discharge to septic (floor drain – boiler room/janitor's closet)	Yes	Yes	-	Comply with UIC regulations
Electrical transformer	Yes	Yes	Moderate	Ranking increased due to proximity to Well #2
Residential land use	Yes	Yes	Moderate	Septic systems and household hazardous materials

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

are included in the IWPA.

There is no evidence of a continuous, protective confining clay layer in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer.

The pH of the water is adjusted with potassium carbonate for corrosion control prior to distribution. You may request additional information regarding the quality of the water, from the local contact listed in Table 1. Please refer to the following section, attached map of the Zone I and IWPA and Table 2 for additional assessment information.

2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Non-conforming Zone I**
2. **Nursing Home**
3. **Floor drains**
4. **Residential housing**
5. **Aboveground storage tank**
6. **Transportation corridor/parking**

There are several activities within the Zone I and IWPA that pose a significant threat to the water supply. The overall ranking of susceptibility to contamination for the system is high based on the types of activities and the proximity of those activities to the wells.

The Mary Lyon Nursing Home administration is proposing an expansion of the facility and is presently negotiating with the Department regarding strategies to develop a more protected source of water for the facility.

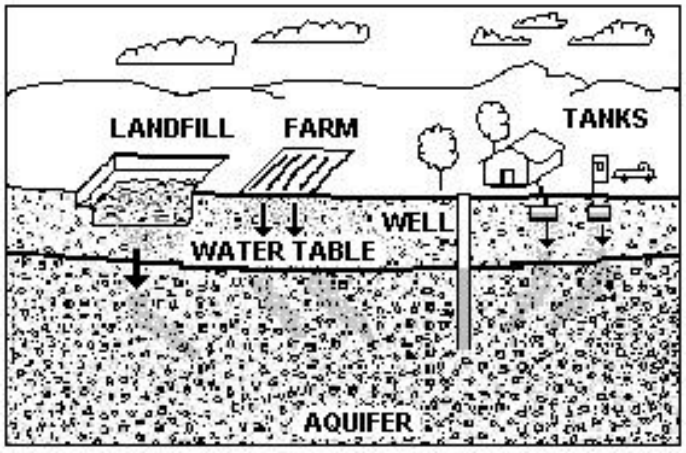

Figure 1: Example of how a well could become contaminated by different land uses and activities.

1. Non-conforming activities within Zone I – The water supplier does not own or control the entire Zone I area for either well. Systems that do not meet DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership and non-conformance, prior to increasing water use or modifying systems.

Zone I Recommendations:

- Prohibit any additional activities within Zone I and where feasible remove non-conforming activities within the Zone I areas.
- Locate a new well and remove as is feasible, non-conforming activities.
- Replace the diesel generator with a propane generator or replace the tanks and provide containment.
- Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
- Monitor all deliveries of hazardous materials.
- Do not use or store pesticides, fertilizers or road salt within the Zone I.

2. Nursing Home - All of the facility is located within the Zone I or IWPA of the well. Potential exists for

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

contamination of the well by onsite use of cleaning materials, household hazardous materials, fertilizers, and pesticides, all of which can be of concern. The facility should be using applicable BMPs to eliminate any potential non-sanitary waste from the wastewater stream.

Recommendations:

- Use of Best Management Practices for all activities at the facility. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required. Do not use or store pesticides, fertilizers or deicing materials within Zone I.
- Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- Review your emergency response plan regarding accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- Monitor roadside and parking areas for spills and leaks. This is particularly important since the storm drains discharge directly to the ground.

3. Floor Drains in Boiler Room – There are floor drains in the boiler room, that discharge to a dry well and janitors sinks that discharge to the septic system. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials (boiler blowdown) may enter the floor drain. The floor drain must be protected to prevent boiler blowdown or other prohibited discharges through the floor drain.

Recommendations:

- Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached). Ensure that that the renovation designs are in compliance.
  - Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122).
- Seal all cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.
- Install a tight tank for disposal of non-sanitary wastewater.

4. Residential housing – Residential development in general poses minimal threat to public and private water supplies provided there is proper management of household hazardous materials and maintenance of septic systems. Septic systems are located within the IWPA of the wells. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

Recommendations:

- Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems and supply this information to the Town to distribute to residents.
- Work with the town to promote household hazardous waste collection days.

5. Aboveground Storage Tank (AST) – The diesel ASTs are located immediately adjacent to Well #2, are not within containment and appear to be deteriorating. If managed improperly, ASTs can pose a risk of contamination due to leaks or spills of the chemicals they store.

Recommendations:

- Consider replacing the diesel generator with a propane generator.
- Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

- Remove or relocate the ASTs from the Zone I, or provide 110% secondary containment for the AST. Comply with all provisions of the regulations regarding AST. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, local regulations and fire code requirements.

6. Transportation corridor/parking – Main Street and Wilbraham Road are located within the Zone I and IWPA of the wells. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

Recommendations:

- Monitor and manage stormwater from parking areas to protect Well #2.
- Work with the Town Highway Department to determine the location and discharge points of road runoff as is feasible. If reasonable, discharge stormwater to discharge downgradient of the well.
- The town should review their eligibility for potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). For more information, call the local office in Hadley at 413-585-1000 or visit the U.S.D.A. web site at www.ruraldev.usda.gov. Fact sheets are available online - http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf.
- Prepare an Emergency Response Plan that includes coordination with the town emergency responders in the event of an accident near the wellhead.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well's susceptibility to contamination.

Please review and adopt the key recommendations listed above and as follows:

Zone I and IWPA:

- Pursue source replacement.
- Provide drainage controls around the casing at Well #2 to prevent parking lot runoff from inundating the casing.
- Remove the dumpster from Zone I.
- Prohibit any new non-water supply activities from the Zone I.
- Conduct regular inspections of the Zone I.
- Post drinking water supply signs in key location such as along the access road and in the parking area away from the well.
- Prohibit the use of pesticides on the lawns in Zone I.
- Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

Training and Education:

- Maintenance staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator.
- Provide information regarding the proper disposal and mainatanace of septic systems.

Facilities Management:

- Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator.
- Incorporate an Integrated Pest Management (IPM) approach into your pest/lawn management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.

Planning:

- Work with local officials to develop an Aquifer Protection District Bylaw that includes all public water supply IWPAs and to assist you in continued protection of the water supply.
- Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. If funds are available, each program year, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet